Hydroalcoholic Extract of Ziziphus Jujuba Leaf to Prevent Ethylene Glycol and Ammonium Chloride-Induced Kidney Stones in Male Rat: Is it Effective?

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Abstract

Purpose: This study aimed to evaluate the effect of Ziziphus jujuba (Z. jujuba) leaf hydroalcoholic extract on the prevention/treatment of kidney stones.

Materials and methods: Thirty-six male Wistar rats were randomly divided into six groups: control, Sham (kidney stone induction (KSI) by ethylene glycol 1% + ammonium chloride 0.25% through drinking water for 28 days), Prevention groups 1, 2 (KSI and Z. jujuba leaf (250 and 500 mg/kg, respectively) through gavage for 28 days), and Treatment groups 1, 2 (KSI and Z. jujuba leaf (250 and 500 mg/kg, respectively) from the 15th day). On the 29th day, the rats' 24-hour urine was assessed, the animals were weighed, and blood samples were taken. Finally, after nephrectomy and weighing the kidneys, tissue sections were prepared to examine the number of calcium oxalate crystals and tissue changes.

Results: The results indicated a significant increase in kidney weight and index, tissue changes, and the number of calcium oxalate crystals in the Sham group compared to the control; using Z. jujuba leaf considerably reduced them in experimental groups compared to the Sham. Body weight decreased in the Sham and experimental groups (except the prevention 2 group) compared to the control, while this observed reduction was lower in all experimental groups compared to the Sham. The mean urinary calcium, uric acid, creatinine, and serum creatinine in Sham and experimental groups (except the prevention 2 group) indicated a substantial increase compared to the control and decreased significantly in all experimental groups compared to the Sham.

Conclusion: Hydroalcoholic extract of Z. jujuba leaf is effective in the reduction of calcium oxalate crystals forming, and its most effective dose was 500mg/kg.

Keywords: Ziziphus jujube, ammonium chloride, ethylene glycol, nephrolithiasis, Rat